THE BORERS OF CERTAIN SHADE TREES.

BY A. S. PACKARD, JR.

In no way can the good taste and public spirit of our citizens be better shown than in the planting of shade trees. Regarded simply from a commercial point of view one cannot make a more paying investment than setting out an oak, elm, or maple or other shade tree about his premises. To a second generation it becomes a precious heirloom, and the planter is duly held in remembrance for those finer qualities of heart and head, and the wise forethought which prompted a deed simple and natural, but a deed too often undone. What an increased value does a fine avenue of shade trees give to real estate in a city? And in the country the single stately elm rising gracefully and benignantly over the wayside cottage, year after year like a guardian angel sending down its blessings of shade, moisture and coolness in times of drought, and shelter from the pitiless storm, recalls the tenderest associations of generations after generations that go from the old homestead.

Occasionally the tree, or a number of them, sicken and die, or linger out a miserable existence, and we naturally after failing to ascribe the cause to bad soil, want of moisture or adverse atmospheric agencies, conclude that the tree is infested with insects, especially if the bark in certain places seems diseased. Often the disease is in streets lighted by gas, attributed to the leakage of the gas. Such a case has come up during the past year at Morristown, New Jersey. An elm was killed by the Elm borer, *Compsidea tridentata* of Olivier, and the owner was on the point of suing the Gas Company for the loss of the tree from the supposed leakage of a gas pipe. While the matter was in dispute, Mr. W. C. Baker of that city took the pains to peel off a piece of the bark and found, as he writes me,

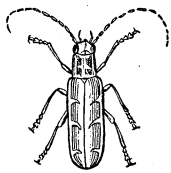
"great numbers of the larvæ of *C. tridentata* in the bark and between the bark and the wood, while the latter is 'tattooed' with sinuous grooves in every direction and the tree is completely girdled by them in some places. There are three different sizes of the larvæ, evidently one, two and three years old, or more properly six, eighteen and thirty months old." The tree had to be cut down.

Dr. Harris, in his Treatise on injurious insects, gives an account of the ravages of this insect which we quote: "On the 19th of June, 1846, Theophilus Parsons, Esq., sent me some fragments of bark and insects which were taken by Mr. J. Richardson from the decaying elms on Boston Common, and among the insects I recognized a pair of these beetles in a living state. The trees were found to have suffered terribly from the ravages of these insects. Several of them had already been cut down, as past recovery; others were in a dying state, and nearly all of them were more or less affected with disease or premature decay. Their bark was perforated, to the height of thirty feet from the ground, with numerous holes, through which insects had escaped; and large pieces had become so loose, by the undermining of the grubs, as to yield to slight efforts, and come off in flakes. The inner bark was filled with burrows of the grubs, great numbers of which, in various stages of growth, together with some in the pupa state, were found therein; and even the surface of the wood, in many cases, was furrowed with their irregular tracks. Very rarely did they seem to have penetrated far into the wood itself; but their operations were mostly confined to the inner layers of the bark, which thereby became loosened from the wood beneath. The grubs rarely exceed three-quarters of an inch in length. They have no feet, and they resemble the larvæ of other species of *Saperda*, except in being rather more flattened. They appear to complete their transformations in the third year of their existence.

"The beetles probably leave their holes in the bark during

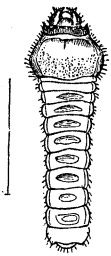
the month of June and in the beginning of July; for, in the course of thirty years, I have repeatedly taken them at various dates, from the 5th of June to the 10th of July. It is evident, from the nature and extent of their depredations, that these insects have alarmingly hastened the decay of the elm-trees on Boston Mall and Common, and that they now threaten their entire destruction. Other causes, however, have probably contributed to the same end. It will be remembered that these trees have greatly suffered, in past times, from the ravages of canker-worms. Moreover, the impenetrable state of the surface-soil, the exhausted condition of the subsoil, and the deprivation of all benefit from the decomposition of accumulated leaves, which, in a state of nature, the trees would have enjoyed, but which a regard for neatness has industriously removed, have doubtless had no small influence in diminishing the vigor of the trees, and thus made them fall unresistingly a prey to insect-devourers. The plan of this work precludes a more full consideration of these and other topics connected with the growth and decay of these trees; and I can only add, that it may be prudent to cut down and burn all that are much infested by the borers."

Fig. 115.



Compsidea tridentata.

Fig. 116.



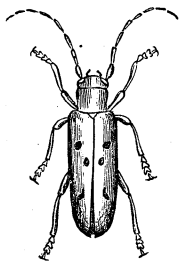
Larva of *Compsidea tridentata.*

The Three-toothed Compsidea (Fig. 115), is a rather flat-bodied, dark brown beetle, with a rusty red curved line behind the eyes, two stripes on the thorax, and a three-toothed stripe on the outer edge of each wing cover. It is about one-half an inch in length.

The larva (Fig. 116, drawn from the living specimen) is white, subcylindrical, a little flattened, with the lateral fold of the body rather prominent; the end of the body is flattened, obtuse, and nearly as wide at the end as at the first abdominal ring. The head is one-half as wide as the pro-

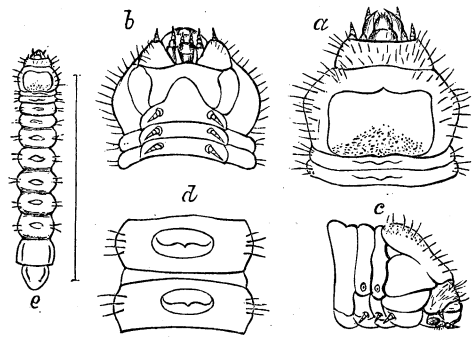
thoracic ring, being rather large. The prothoracic, or segment just behind the head, is transversely oblong, being about twice as broad as long; there is a pale dorsal corneous transversely oblong shield, being about two-thirds as long as wide, and nearly as long as the four succeeding segments; this plate is smooth, except on the posterior half, which is rough, with the front edge irregular and not extending far down the sides. Fine hairs arise from the front edge and side of the plate, and similar hairs are scattered over the body and especially around the end. On the upper side of each segment is a transversely oblong ovate roughened area, with the front edge slightly convex, and behind slightly arcuate. On the under side of each segment are similar rough horny plates, but arcuate in front, with the hinder edge straight.

Fig. 117.



Saperda vestita.

Fig. 118.

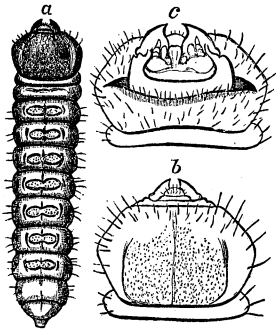


Saperda vestita, larva.

It differs from the larva of *Saperda vestita* Say, in the body being shorter, broader, more hairy, with the tip of the abdomen flatter and more hairy. The prothoracic segment is broader and flatter, and the rough portion of the dorsal plates is larger and less transversely ovate. The structure of the head shows that its generic distinctness from Saperda is well founded, as the head is smaller and flatter, the clypeus being twice as large, and the labrum broad and short, while in *S. vestita* it is longer than broad. The mandibles are much longer and slenderer, and the antennæ are much smaller than in *S. vestita*.

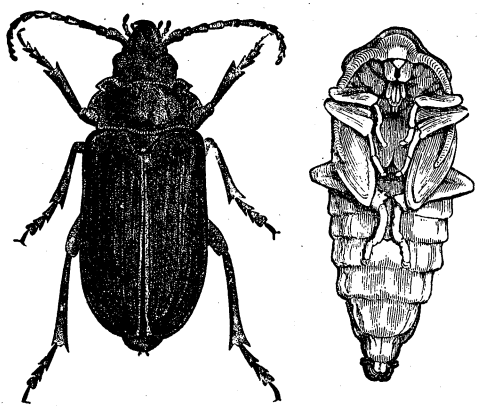
The Linden Tree-borer (*Saperda vestita* of Say, Fig. 117) is a greenish snuff yellow beetle, with six black spots near the middle of the back; and it is about eight-tenths of an inch in length, though often smaller. The beetles, according to Dr. Paul Swift, as quoted by Dr. Harris, were found (in Philadelphia) upon the small branches and leaves on the 28th day of May, and it is said that they come out as early as the first of the month, and continue to make their way through the back of the trunk and large branches during the whole of the warm season. They immediately fly into the top of the tree, and there feed upon the epidermis of the tender twigs, and the petioles of the leaves, often wholly denuding the latter, and causing the leaves to fall. They deposit their eggs, two or three in a place, upon the trunk or branches, especially about the forks, making slight incisions or punctures for their reception with their strong jaws. As many as ninety eggs have been taken from a single beetle. The grubs (Fig. 118*e*; *a*, enlarged view of the head seen from above; *b*, the under view of the same; *c*, side view, and *d*, two rings of the body enlarged), hatched from these eggs, undermine the bark to the extent of six or eight inches, in sinuous channels, or pen-

Fig. 119.



Saperda calcarata, larva.

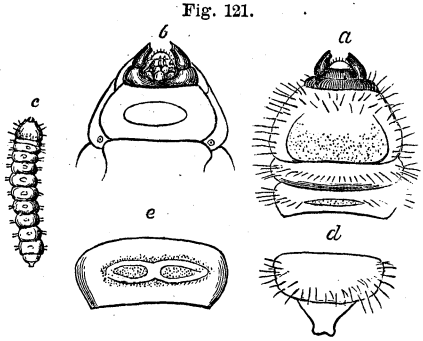
Fig. 120.



Prionus brevicornis and pupa.

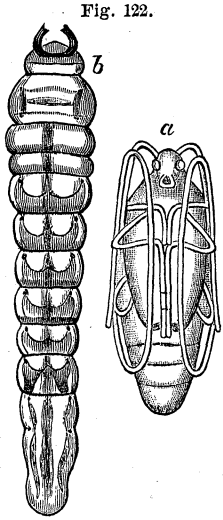
etrate the solid wood an equal distance. It is supposed that three years are required to mature the insect. Various expedients have been tried to arrest their course, but without effect. A stream, thrown into the tops of trees from the hydrant, is often used with good success to dislodge other insects; but the borer-beetles, when thus disturbed, take wing and hover over the trees till all is quiet, and then alight and go to work again. The trunks and branches of some of the trees have been washed over with various preparations without benefit. Boring the trunk near the ground, and putting in sulphur and other drugs, and plugging, have been tried with as little effect.

Fig. 121.



Saperda inornata and larva.

Fig. 122.



Monohammus titillator, larva and pupa.

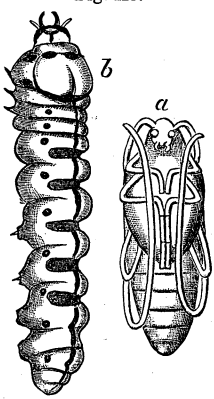
The city of Philadelphia has suffered grievously from this borer.

Dr. Swift remarks, in 1844, that "the trees in Washington and Independence Squares were first observed to have been attacked about seven years ago. Within two years it has been found necessary to cut down forty-seven European lindens in the former square alone, where there now remain only a few American lindens, and these a good deal eaten." In New England this beetle should be looked for during the first half of June.

The Poplar tree is infested by another species of Saperda (*S. calcarata* of Say). This is a much larger beetle than

those above mentioned, being an inch or a little more in length. It is gray, irregularly striped with ochre, and the wing-covers end in a sharp point. The grub (Fig. 119 *a*; *b*, top view of the head; *c*, under side) is about two inches long and whitish yellow. It has, with that of the Broad-necked Prionus (*P. laticollis* of Drury, Fig. 120 and pupa), as Harris states, "almost entirely destroyed the Lombardy poplar in this vicinity (Boston). It bores in the trunks, and the beetle flies by night in August and September. We also figure the larva of another borer (Fig. 121 *c*; *a*, top view of the head; *b*, under side; *e*, dorsal view of an abdominal segment; *d*, end of the body, showing its peculiar form), the *Saperda inornata* of Say, the beetle of which is black, with ash gray hairs, and without spines on the elytra. It is much smaller than any of the foregoing species, being nine-twentieths of an inch in length. Its habits are not known. We also figure, from the manuscript work of Abbot, the larva and pupa (Fig. 122, *a*, pupa; *b*, larva) of *Monohammus titillator* of Fabricius, but he does not state on what tree it feeds. We copy also a figure of the larva and pupa of *Chion cinctus* (Fig. 123, *a*, pupa; *b*, larva), from the same work. The author gives no account of its habits.

Fig. 123.



Chion cinctus, larva and pupa.

SPRINGTIME ON THE YUKON.

BY W. H. DALL.

HAVING joined the readers of the NATURALIST in a winter day's journey on the Ulukuk portage not long since, we may, if so inclined, try our fortune again together, in the